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# Isoperimetric inequality for torsional rigidity in multidimensional domains

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## Abstract

We consider the Saint-Venant functional P for the torsional rigidity in an arbitrary plane or spatial domain. The main result of this paper is the sharp estimate P < (4/n)m, where n is the dimension of the space, and m is the harmonic mean of moments of inertia of the domain about the coordinate planes. The extremal domains are ellipsoids of a special kind. Thus, we obtain a generalization of the isoperimetric inequality proved by E. Nicolay for the torsional rigidity of simply connected plane domains. © Allerton Press, Inc., 2012.

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## Keywords

Isoperimetric inequality, Moments of inertia, Torsional rigidity